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CONCERNING *COLIAS EURYTHEME ALBERTA*  
BOWMAN (PIERIDAE)

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*Colias eurytheme alberta* was described by Bowman (1942) but has received little attention other than by Bowman himself (1944, 1951), and dos Passos (1964) places *alberta* as a subspecies of *Colias alexandra* Edwards. A close examination of a Bowman paratype in the U.S. National Museum and of Bowman's original description confirms that *alberta* is not related to *Colias eurytheme* but to that part of the *Colias alexandra* population best known as *Colias christina* Edwards. I believe that Bowman actually redescribed *Colias alexandra christina* and his name should be sunk as an absolute synonym.

Bowman's description of *alberta* and his placing of it under *eurytheme* Boisduval appears to be based on two mistaken assumptions that he held: (1) Those *alexandra/christina* blend zone specimens from southern Alberta, which I refer to as *astraea* Edwards, were apparently considered by Bowman to be typical of *Colias christina*, and (2) he apparently considered phenotypical *Colias christina* populations from northern Alberta to be *eurytheme*. Then in 1941, as Bowman relates in his description, there was a large migration of *Colias eurytheme* from the south into Alberta, which gave Bowman an opportunity to compare his Alberta *eurytheme* (actually *christina*) from the Peace River country with typical *eurytheme*. He found them very distinct, as indeed they are, and redescribed *christina* as a subspecies of *Colias eurytheme*. A confirmation of Bowman's errors, in this regard, are to be found in his list of Alberta Lepidoptera (Bowman, 1951) in which he records *christina* as occurring only in the southern and western parts of the province where the

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*astraea* forms occur and not at all in the northern parts of the province, where it actually occurs; while recording *eurytheme alberta* only from extreme northern Alberta localities where typical *christina* is known to occur.

A second consideration has been to determine whether *alberta* could be construed to represent a valid subspecies in the *C. alexandra* complex or whether it is an absolute synonym for *christina*, as I have concluded that it is.

The orange phenotype of *Colias alexandra*, *christina*, occurs from the Great Slave Lake region of the District of Mackenzie, south to Lake Athabasca and the Peace River region of Alberta, eastward through northern Saskatchewan to the vicinity of The Pas, Manitoba, then southward, along the Manitoba Escarpment, to Riding Mountain and the vicinity of Brandon, and then appears again as an isolated population (*krauthi* Klots) in the Black Hills of South Dakota. From southern Alberta and British Columbia through Idaho and Montana to northern Wyoming, there is a broad band of gradual intergradation (forms *astraea* and *emilia* Edwards) of the orange phenotype to the yellow one. The yellow phenotype, nominate *alexandra*, occurs in the Rocky Mountains of southern Wyoming, Colorado, Utah, Arizona and New Mexico and in the Pine Ridge region of northwest Nebraska. Hovanitz (1950) also allied the west coast populations of *Colias occidentalis* Scudder, *C. harfordii* H. Edwards and *C. barbara* H. Edwards with *C. alexandra*, a conclusion that I am inclined to agree with.

I have only examined one paratype of *alberta* (a male in the U.S. National Museum, Wembley, Alberta, 25 June 1925), however, in an examination of specimens from the entire range of *christina* I have found no distinguishing characteristics that could lead to a subspecific designations. Males from Alberta, Saskatchewan and Manitoba are identical and cannot be separated, while South Dakota males (*krauthi*) can be distinguished only by a more greenish appearance ventrally. The females are quite variable in the black borders of the dorsal fore-wings and in the background color with orange, yellow and white forms occurring. However, all forms occur in all localities and if any differences occur, they are of a statistical nature involving the percentages of given forms or combination in a given locality. Actually the type localities of *christina* (the portage of the Slave River between Lake Athabasca, Alberta and Great Slave Lake, District of Mackenzie) and *alberta* (Wembley, Alberta) are quite close together and even if a clinal subspecies in *christina* could be sup-

ported, *alberta* could not apply as it comes from the same end of the cline as *christina*. Manitoba collectors normally call their specimens of *christina* by the subspecific name *mayi* Chermock & Chermock, however *mayi* is actually the Riding Mountain subspecies of *Colias gigantea* Strecker and not *christina* at all (Masters, paper in preparation).

*Colias eurytheme alberta* ab. *pallidissima* Bowman was described at the same time as *alberta*. This is nothing but the white female, and can be considered a synonym to *pallida* Cockerell, however both are infraspecific names with no standing under The Code (International Code of Zoological Nomenclature). If it is necessary to designate the dimorphic white females, in an infraspecific sense, I feel that it is preferable to use the name "alba" as a *nomen collectivum* for the white females of all dimorphic *Colias* species.

F. Martin Brown of Colorado Springs is currently studying the types of butterflies described by W. H. Edwards and since five of the seven names available in a subspecific sense in the *Colias alexandra/christina* complex were proposed by Edwards, I will not attempt to revise the species until his study is complete.

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